

Application Number 10/534,633
Amendment dated December 19, 2006
Response to Advisory action of December 1, 2006

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Remarks/Arguments

Claims Rejections – 35 USC 102(b)

Claims 1-4, 6-10 and 12-14 stand rejected under 35 USC 102(b) as being anticipated by Huffman (3,169,200).

Examiner suggests that Huffman teaches in Fig 4 a thermotunneling device comprising a collector electrode 39 and an emitter electrode 30, the collector electrode 39 having a surface facing the emitter electrode, characterized in that an insulator layer covers the surface of the collector.

The present invention, however, as can be clearly seen from Figure 2b, has a gap d₁ between the emitter and the surface of the insulator layer disposed on the collector.

For a claim to be anticipated, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Huffman does not teach a gap between the emitter and the insulator (oxide spacers), therefore the present invention is not anticipated by Huffman.

Applicant notes that claims 1 and 8 of the present invention do not clearly distinguish the present invention from the prior art of Huffman, and has amended these claims accordingly.

Applicant therefore believes that claims 1 and 8 as amended are not anticipated by Huffman. Furthermore, applicant believes that claims 2-4, 6 and 7, because of their dependency on claim 1, and claims 9, 10 and 12-14, because of their dependency on claim 8, are not anticipated by Huffman.

Applicant respectfully requests that Examiner withdraw his objections to these claims 1-4, 6-10 and 12-14 under 35 USC 102(b).

Claims Rejections – 35 USC 102(e)

Claims 15-17 and 20, 21 stand rejected under 35 USC 102(e) as being anticipated by Sung (2003/0168957).

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Examiner supposes that Sung is describing applying a bias voltage to an emitter electrode 30; placing a collector electrode 25 at a distance d_0 from the emitter electrode 30; placing an insulator layer a distance d_1 from the emitter electrode 30, wherein d_1 is greater than zero; and contacting the insulating layer 5 and the collector layer 25.

First it is clear from Fig. 2 of Sung that 30 has a large positive sign adjacent to it, and 25 has a large negative sign adjacent to it, and Applicant has previously argued that therefore 30 is an anode and 25 is a cathode.

In the Advisory Action dated December 1, 2006, Examiner indicated that a person of ordinary skill in the art normally will identify a cathode as either a positive terminal or a negative terminal depending on the type of device the cathode is attached to.

The US Classification of Sung is to Class 313/311, and section V of the classification description (the 'GLOSSARY') of section 313 of the USPTO classification system, states:

ANODES

An electrode which acts as the positive terminal of the discharge or which acts as the positive terminal of an electric field to cause a discharge or accelerate the electrons in a discharge. See the definition of cathode above, and the definition of control electrode below.

CATHODE

An electrode which acts as the negative device. In some discharge devices, such as spark gaps, there is no difference in structure between the cathode and anode. Consequently, the use of the words "cathode" and "anode" have been avoided except where there is some significance in structure between the two electrodes.

Thus in the field of invention closest to Sung, the definitions above would tend to suggest to the person of ordinary skill in the art that 30 is in fact an anode and 25 a cathode.

Whilst Examiner suggests that according to *The Encyclopedia Britannica* the cathode should be "identified as the positive terminal, which would be terminal 30 in Sung", this runs counter to the teaching of Sung in the description of Fig.2 at paragraph [0047]:

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Referring now to FIG. 2, is shown one embodiment of an electrical generator in accordance with the present invention. Notably, the amorphous diamond material 5 has an electrode 25 coupled to the input surface 10 to form a cathode. Further, an energy collector 40 is coupled to the electrode. The energy collector may be included as desired, in order to enhance the collection and transmission of thermal or photonic energy to the amorphous diamond material. An anode 30 is placed adjacent to the emission surface 15 of the amorphous diamond material, with a vacuum space 35 separating the emission surface from the anode.

Here Sung very clearly identifies that 30 is the anode.

Parenthetically, the definition of 'cathode' supplied by the Examiner is from a subscription service, and the copy of the citation Examiner included in the Advisory Action had a significant proportion of the text on the right hand side of the document missing. In as much as what can be deciphered, the notion that a cathode is the positive term(inal?) is in relation to a battery, which devices are classified differently by the USPTO.

Thus Examiner's interpretation appears to run counter to the actual teaching in Sung.

In particular, Examiner supposes that Sung teaches contacting the insulating layer 5 and the collector layer 25, but in fact it is clear that Sung teaches contacting the insulator layer 5 and the emitter layer (cathode) 25; the collector layer (anode) 30 is some distance from the insulator layer 5. In other words, in Sung, the insulator layer and the collector are not in contact.

Applicant therefore respectfully suggests that Sung does not anticipate the present invention in claim 15, nor in claims 16, 17, 20 and 21 because of their dependency on claim 15, and Applicant respectfully requests that Examiner withdraw his objections to claims 15-17 and 20, 21 as being anticipated by Sung under 35 USC 102(e).

Claims Rejections – 35 USC 103

Claims 5 and 11 stand rejected under 34 USC 103 as being unpatentable over Huffman in view of Sung. Claims 18 and 19 stand rejected under 34 USC 103 as being unpatentable over Sung in view of Huffman.

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In view of the amendment made to claims 1 and 8 and the corresponding arguments made above, and the arguments made above in relation to claim 15, Applicant believes that the present invention is patentable over the prior art of Huffman and Sung.

Applicant has also made amendments to claims 4, 5, 11 and 15 in order to improve their clarity. No new material has been added by these amendments.

Applicant respectfully submits that this application, as amended, is in condition for allowance, and such disposition is earnestly solicited. If the Examiner believes that discussing the application the Applicant over the telephone might advance prosecution, Applicant would welcome the opportunity to do so.

Applicant is making this reply within three months of the mailing date of the final action.

Respectfully submitted,



Avto TAVKHELIDZE
Inventor